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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,252

09/26/2006

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EXAMINER

GHYKA, ALEXANDER G

ART UNIT

PAPER NUMBER

2812

MAIL DATE

DELIVERY MODE

03/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,252	Applicant(s) FUJIMURA ET AL.	
	Examiner Alexander G. Ghyka	Art Unit 2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,8,11,13,15,17,18,20 and 22-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7,9,10,12,14,16,19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/26/2006 and 11/29/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Claims 2, 4, 8, 11, 13, 15, 17, 18, 20 and 22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/19/2007.

Claims 1, 3, 5, 6, 7, 9, 10, 12, 14, 16, 19 and 21 are now under consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 6, 7, 9, 10, 12, 14, 16, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hironari (JP 2002-324795 submitted by Applicants) in view of Yoshino (US 4,671,813).

The present Claims generally require a method of forming an oxynitride film, characterized by providing a solid dielectric on at least one of opposed surfaces of a pair of electrodes opposed to each other under nearly atmospheric pressure, introducing a nitrogen gas containing oxygen or an oxide at higher than 1ppm and equal to or lower than 0.2 % into a space between the pair of opposed electrodes, applying an electric field to the nitrogen gas, and bringing the resulting plasma into contact with an

object to be processed to form an oxynitride film on a surface of the object to be processed.

With respect to Claims 1, 19 and 21, Hironari disclose forming a nitride treatment of a silicon wafer where a solid is installed on the opposing surface of the electrode on at least one side of a pair of electrodes opposing to each other under the pressure in the vicinity of the atmospheric pressure and nitrogen-containing gas is introduced between the pair of the electrodes opposing to each other to apply a pulse shaped electric field to the gas, whereby an obtainable plasma is brought into contact with the silicon wafer.

Hironari differs from the present claims in that it does not disclose the presence of oxygen or an oxide at higher than 1ppm and equal to or lower than 0.2 % in the nitrogen gas, and the subsequent formation of silicon oxynitride.

Yoshino et al disclose that nitrogen gas used in the electronics industry comprises from 5 to 1000 ppm of oxygen impurity. See column 5, line 60 to column 6, line 12.

It would have been obvious to one of ordinary skill in the art, at the time of the invention, that the conventional nitrogen gas called for by Hironari contains oxygen impurities in view of the disclosure of Yoshino et al that nitrogen gas contains 5 to 1000 ppm oxygen impurity. In the present case, it would be obvious for one of ordinary skill in the art to arrive at the present Claims by using the nitrogen gas containing the oxygen impurities of Yoshino et al, which is described as conventional. Moreover, the oxygen gas in the nitrogen gas would form oxynitride. As Hironari and Yoshino et al disclose the

same reaction conditions and the same reactants, it would be *prima facie* obvious to one of ordinary skill in the art that the same product, oxynitride, would form.

With respect to Claims 3 and 7, Hironari et al disclose atmospheric pressure (760 mm Hg).

With respect to Claims 5, 6, 9 and 10, as Hironari discloses a nitrogen plasma, it would be obvious to one of ordinary skill in the art that the same active nitrogen species would be observed by optical emission spectroscopy, as nitrogen plasma would have the same active species.

With respect to Claim 12, the plasma is brought into contact with the object to be processed in a diffusion region outside the discharge space between the opposed electrodes. See Figure 3.

With respect to Claim 14, Hironari discloses a silicon wafer. See the Abstract.

With respect to Claim 16, Hironari discloses temperatures of 200 degrees Celcius. See column 6, paragraph 33.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander G. Ghyka whose telephone number is (571) 272-1669. The examiner can normally be reached on Monday through Friday 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone

Art Unit: 2812

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AGG
February 27, 2008

ALEXANDER G. GHYKA

PRIMARY EXAMINER

AU 2812

/Alexander G. Ghyka/